



MOTEX

MOTORIZED BEAM EXPANDER

USER MANUAL

2014

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1. INTRODUCTION

MoTex has an expansion rate from 2.5X to 12X. Although it has such expansion rate all optical distortions are kept as low as possible. We are able to achieve this because of innovative one non rotating moving lens design that is driven by the stepper motor. All electronics that control the stepper motor are integrated into the main housing.

Beam expander can be remotely controlled by software or can be driven by two physical buttons on top of the housing. Using the software user is allowed to select the magnification from the calibrated values by moving a magnification slider or select „user calibration“ to calibrate the device to the desired values. Optional functionality can be realized up on the customers request.

2. APPLICATIONS

- Laser beam size control
- Automatic control of focusing parameters (Numerical Aperture)
- Hands free operation in remote machinery places and hazardous conditions

3. TECHNICAL INFORMATION

3.1. MAIN FEATURES

- Aberration minimized design (special aberration compensation layout)
- Controller embedded in the same housing
- Suitable for usage with ultrafast picosecond and femtosecond lasers
- Optional adjustable mounting interface
- Reduced setup time by automatic magnification adjustment
- Manual magnification control

3.2. SPECIFICATIONS

Continuously variable magnification: 2.5X...12X

Wavelength range (custom wavelength available upon request):

- 1020 – 1070 nm
- 510 – 540 nm
- 340 – 360 nm

Material: Optical crown glass or UV grade fused silica (depending on wavelength)

Control interfaces: USB 1.1/2.0/3.0 ("Virtual serial (COM) port")

Software platform: Control software works in Windows OS: XP/2003/Vista(32/64)/7(32/64)/8(32/64). Linux and MAC users can control device with low level commands (drivers are not necessary), sent through virtual USB serial port.

Entrance beam diameter: up to 10 mm

Output beam diameter: up to 50 mm

Overall transmission: >98.5 %

LIDT: >7 J/cm² for 10 ns pulses @ 1064 nm

Weight: <1 Kg

Positioning: for easier alignment input and output covers have removable aperture caps

3.3. POSSIBLE CONFIGURATIONS

Wavelength and anti-reflective coating (if required) can be selected by customer. Magnification range and output aperture can be selected by the user. Mount has to be ordered separately. Lens covers with alignment holes are included as basic components.

3.4. OPTICAL DESIGN

MoTex optical design for best performance and stability is based on one moving lens design. No lens is rotating when changing the zoom level.

3.5. MECHANICAL DESIGN



Figure 1. MoTex front view.

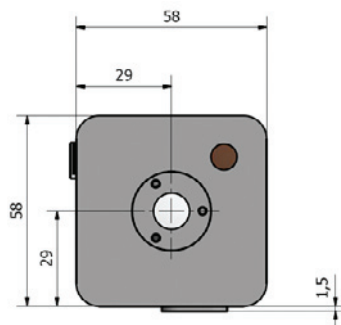


Figure 2. MoTex back view. All dimensions are in millimeters.

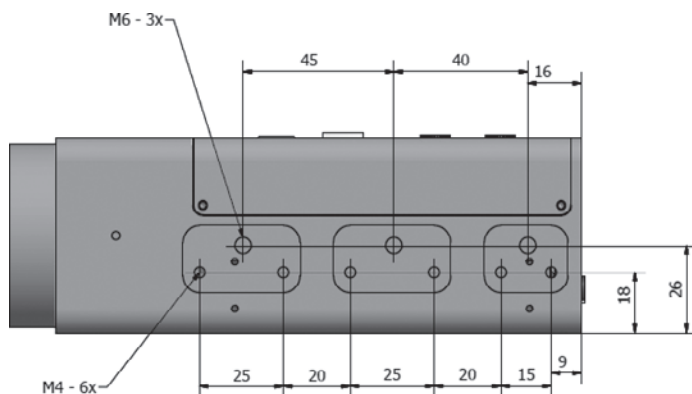


Figure 3. MoTex right side view. All dimensions in millimeters.

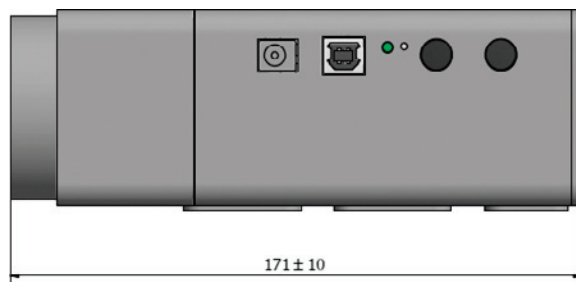


Figure 4. MoTex top view. All dimensions in millimeters.

3.6. ELECTRICAL LAYOUT

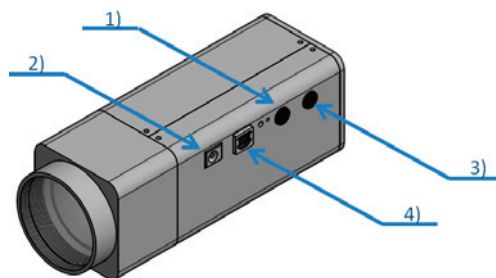


Figure 5. Motex exterior. 1) Increase beam diameter button; 2) 12V power supply; 3) Decrease beam diameter button; 4) USB-B connection.

3.7. PACKAGING CONTENTS

- Motex beam expander with lens covers
- USB cable
- 12V power supply cable
- Software installation instructions

4. HARDWARE INSTALLATION

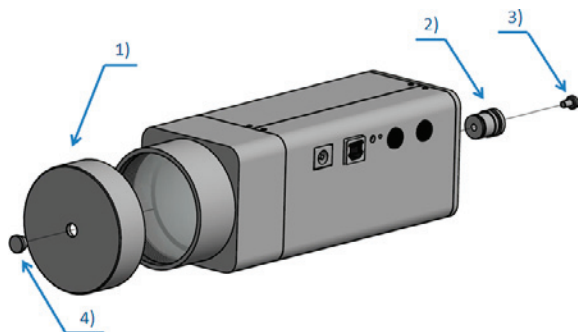


Figure 6. Lens safety caps are marked as 1) and 2), easy alignment caps are marked as 3) and 4).

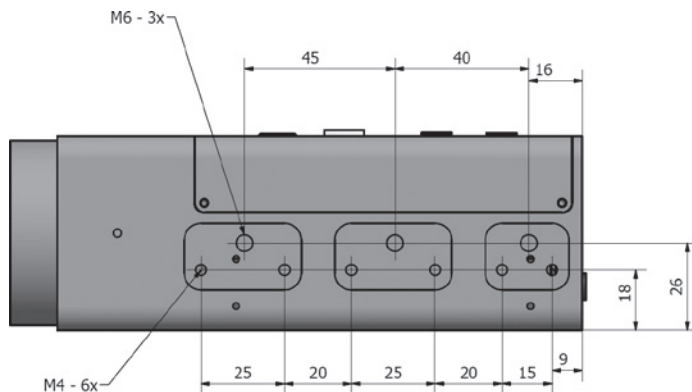


Figure 7. On the right side of MoTex there are three groups of mounting points. On each group there are two M4 threads and one M6 thread. MoTex can be mounted using these threads.

5. MOTEX USAGE WITH WINDOWS PC

5.1. COMPUTER REQUIREMENTS

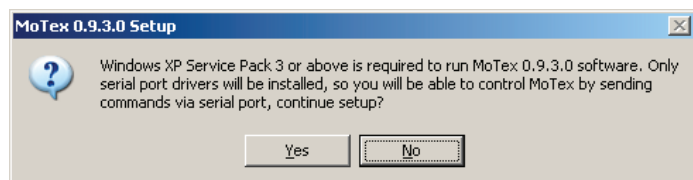
- Free USB port. MoTex is compatible with USB 1.1, USB 2.0 and USB 3.0
- Computer administrator rights (installation only)
- Windows XP sp3 (32-bit)
- Windows Server 2003 sp2 (32-bit)
- Windows Vista sp1 (32/64-bit)
- Windows Server 2008 (32/64-bit)
- Windows 7(32/64-bit)
- Windows 8(32/64-bit)
- Microsoft .Net framework 4.0 redistributable (installs automatically) (please in section ?? for more information)

5.2. SOFTWARE INSTALLATION

1. Check for and download only latest “MoTex” software installer package from

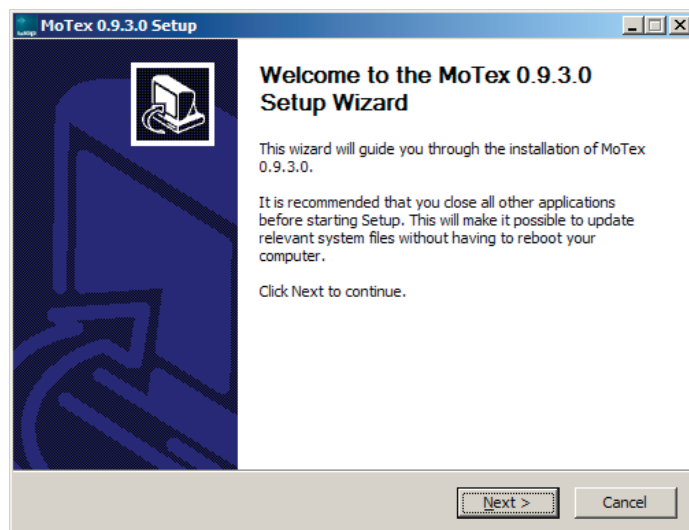
www.wophotonics.com/products/optomechanics/motorized-beam-expander-motex.

2. Run the downloaded “MoTex-Setup.exe” installation file. In case you are installing on operating system that does not meet requirements for “MoTex” software, only USB drivers will be installed.

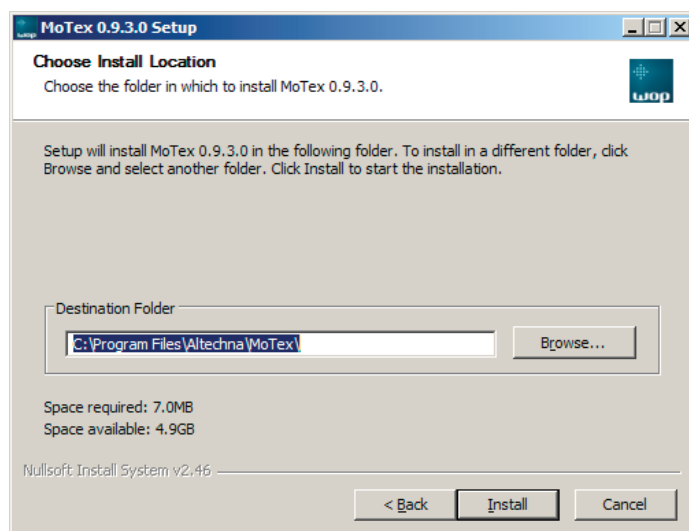


3. Click “Yes” to continue.

4. Installation window will appear, click “Next” to continue:



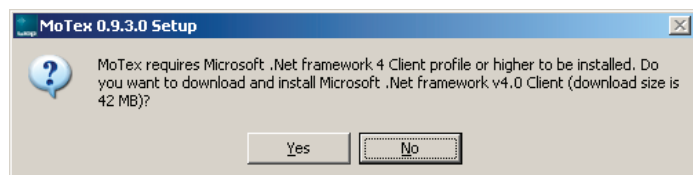
5. Select installation directory and click “Next” to begin installation:



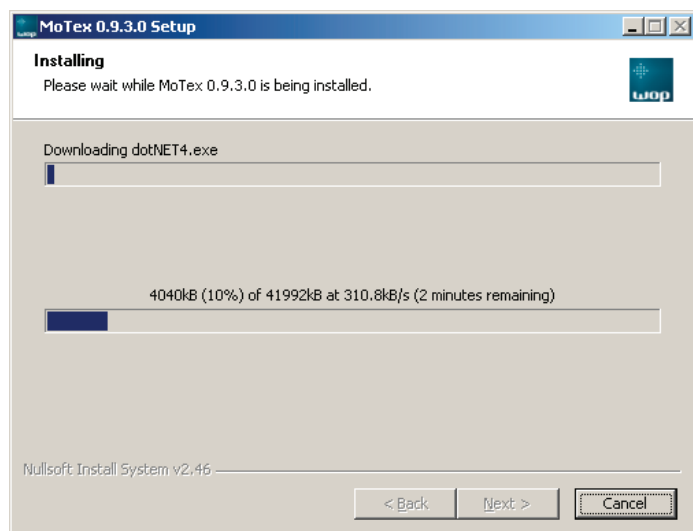
6. "MoTex" software requires "Microsoft .NET Framework 4 Client Profile" or higher version to be installed. Setup will offer to download it, choose "Yes" if you have active internet connection. Choose no to download it from:

www.microsoft.com/en-us/download/details.aspx?id=17113 and install it manually.

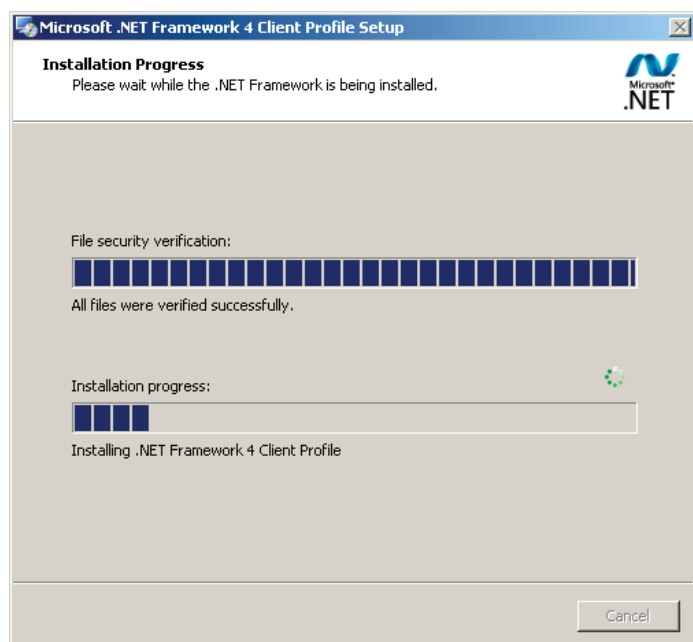
You should choose "No" if you wish to install any newer version of framework, or do not have a working internet connection. This dialog will not appear if framework is already installed. Download size is 42 Mbytes.



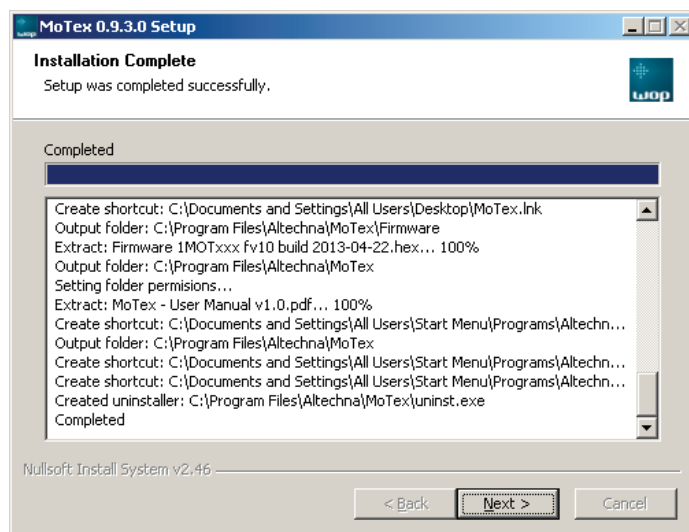
7. Setup will download "Microsoft .NET Framework 4 Client Profile".



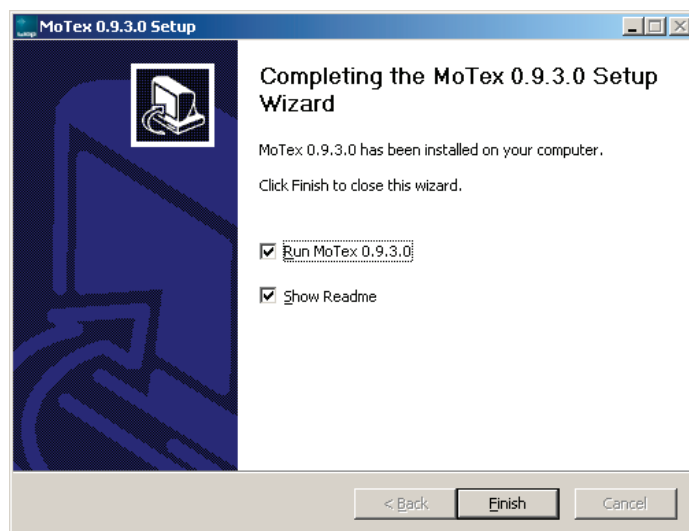
8. After download is finished, "Microsoft .NET Framework 4 Client Profile" will be installed, wait for it to complete. This can take more than 10 minutes on slower computers.



9. Setup will finish by installing drivers. Click "Next" to continue:



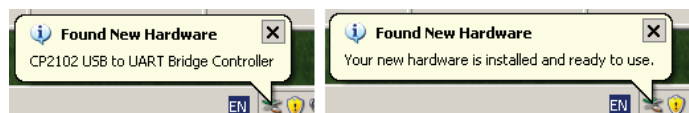
10. Press "Finish" to end installation. Program can not be opened if only drivers were installed (see step 2 for details). "MoTex" software icon will be created on "All Users" desktop and "All Users" start menu.



11. Connect MoTex and PC via USB cable.

12. Plug in MoTex power supply jack and AC adaptor to wall outlet.

13. Windows will detect new hardware. Wait until windows configures new device.



14. Device installation is now complete

5.3. "MOTEX" SOFTWARE DESCRIPTION

If your operating system version meets requirements for "MoTex" software, as shown in Table 1, you will be able to use fully functional MoTex control application. Otherwise, go to section "MoTex serial command summary" on page 8 and read how to use this device with serial port and commands.

"MoTex" program can be started by an icon, located on desktop or in start



menu **MoTex** under "All programs\Altechna\MoTex".

"MoTex" software consists of two windows: "MoTex Selector" window fig. 8 and "MoTex control" window fig. 9.

5.4. "MOTEX SELECTOR" WINDOW OVERVIEW

"MoTex Selector" contains a list of currently connected and powered beam expanders. This window is open all the time while program is running. Functions of this are described in next chapter.

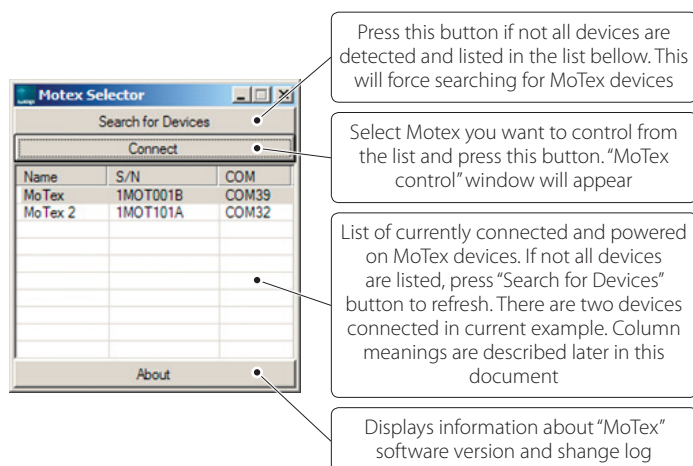


Figure 8. "MoTex Selector" window.

This window is used to choose which device to control if there are more MoTex'es connected to computer.

"Search for Devices" button: you should click this button if not all devices are detected and listed.

"Connect" button: select MoTex device you want to control from the list and click this button. "MoTex control" window will appear. If only one MoTex is connected on program startup, control window will be opened automatically.

Device list column description: "Name" column: it is convenient to give meaningful titles for each MoTex device that will be recognized by the system.

"S/N" column: abbreviation "S/N" means "serial number". This column shows unique MoTex hardware serial number. It is used to distinguish different devices, because factory names for each device are equal. Despite this, user can change name for each device, which is also saved into hardware.

"COM" column: this column shows USB serial port name assigned by Windows. Each MoTex gets unique serial port name after first enumeration with computer. Serial port name is necessary to know for users who want to use serial commands in their applications. See chapter "MoTex serial command summary" on page 8 for more details on this.

5.5. CONTROL WINDOW DESCRIPTION: "ZOOM CONTROL" MODE

First run "MoTex control" window with factory settings (except name) is shown in the picture below; MoTex is set to 250% (2.5x) of magnification. MoTex zooming level can be changed in 0.1% steps. Minimum zoom level is 250% and maximum is 1200%. Enter any number of this range into the upper text field. Decimal point is represented by symbol "." (dot), not comma: for example "600.5" is a valid value, but "600,5" is not. Click "Go" button to apply new zoom value. Lower slider will jump to position representing zoom level of 600.5%. Upper slider will begin to move towards the same position as well. Lower slider reflects percentage entered into textbox, and upper slider shows MoTex position in real time. You can move lower slider to change text box value and vice versa.

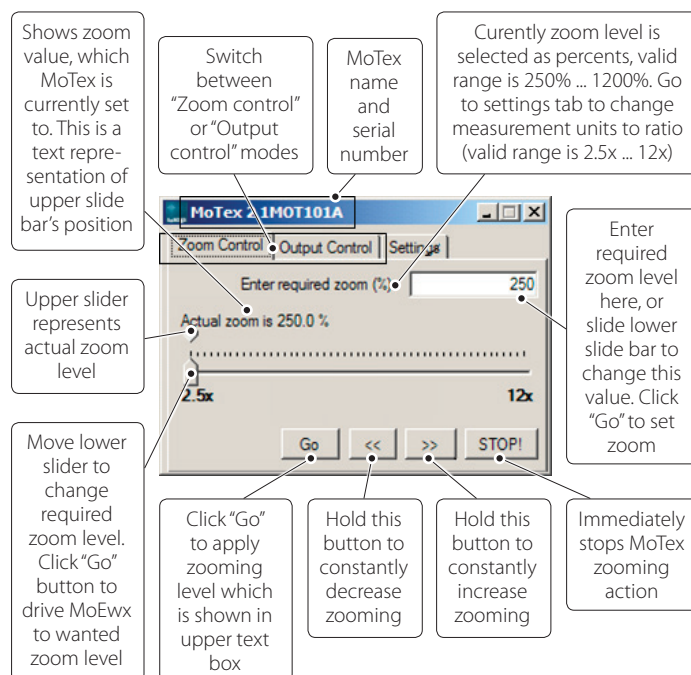


Figure 9. "MoTex control" window in "Zoom control" mode. This window is used to control zooming level if input beam diameter is unknown.

If you do not want to operate with hundreds of percents, go to "Settings" tab and change measurement units to "Ratio..", as shown in fig. 12. Previously used 600.5% will be rounded to 6.01x. With this option enabled user can enter zoom in range of 2.5x .. 12x in steps of 0.01. Control window with new zoom applied (6.01x) is shown in fig. 10. At the output of MoTex the resulting beam diameter will be 6x larger than input, but not wider than 48 mm.

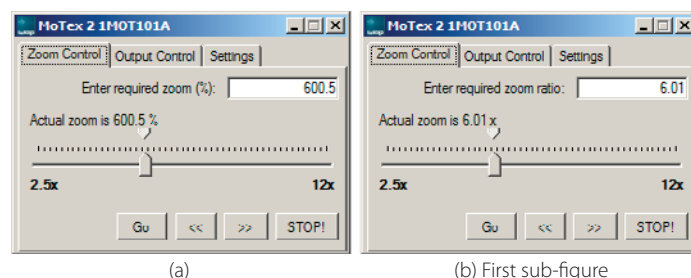


Figure 10. "Zoom control" window when "Measurement units" found in "Settings" tab is set to "Percentage (200%..)" – 10a, and "Ratio (2x..)" – 10b.

Button "Go": click this button to apply zoom level value entered in "Enter required zoom" text field.

Button “<<”: keep pressing this button to continuously decrease output beam diameter. Releasing it will stop MoTex. This button acts the same way as a pushbutton on top of MoTex body, marked as “-” symbol. Device status LED will begin to blink once a second if minimum zoom is reached.

Button “>>”: keep pressing this button to continuously increase output beam diameter. Releasing it will stop MoTex. This button acts the same way as a pushbutton on top of MoTex body, marked as “+” symbol. Device status LED will begin to blink two times in a second if maximum zoom is reached.

“STOP!” button: click this button to cancel zooming operation.

5.6. CONTROL WINDOW DESCRIPTION: “OUTPUT CONTROL” MODE

Users, that know input beam diameter, should switch to “Output control” mode of operation by clicking on “Output control” tab fig. 11. “MoTex control” window with factory settings (except name) is shown in the picture below; MoTex is set to 250% (2.5x) of magnification. User should measure laser beam diameter (measurement units are millimeters) and enter it in upper textbox (“Enter Input Beam Diameter (mm)”). According to it, possible output beam diameter values are recalculated, minimum and maximum values are updated on the ends of lower track bar. For example, if input beam diameter is set to 5 mm, user will be able to enter output beam diameter in range from 12.5 mm (5x2.5 – input beam times minimal zoom) to 48 mm (absolute maximum).

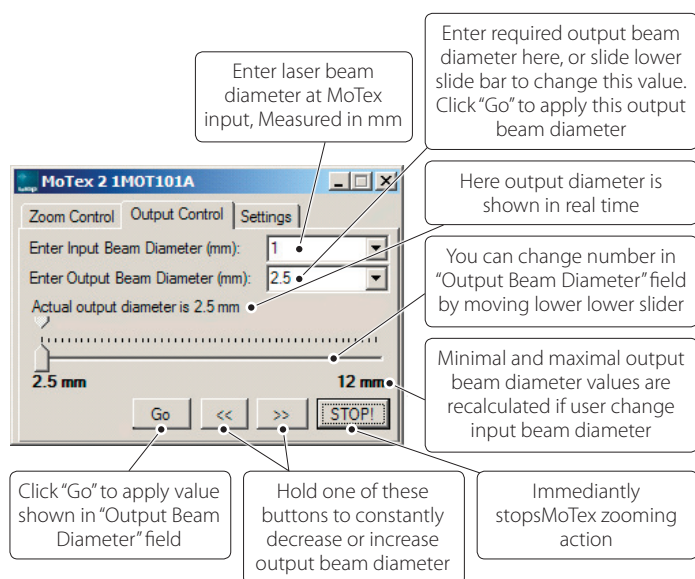


Figure 11. “MoTex control” window in “Output control” mode. This window should be used to control output beam diameter if input beam diameter is known.

5.7. CONTROL WINDOW DESCRIPTION: “SETTINGS” TAB

“Measurement Units” setting is used in “Zoom control” mode to scale percentage value to shorter form. Select “Percentage (200%.)” in order to enter zoom value in range of [250 .. 1200] % or select “Ratio (2x..)” in order to enter zoom value in range of [2.50 .. 12.00].

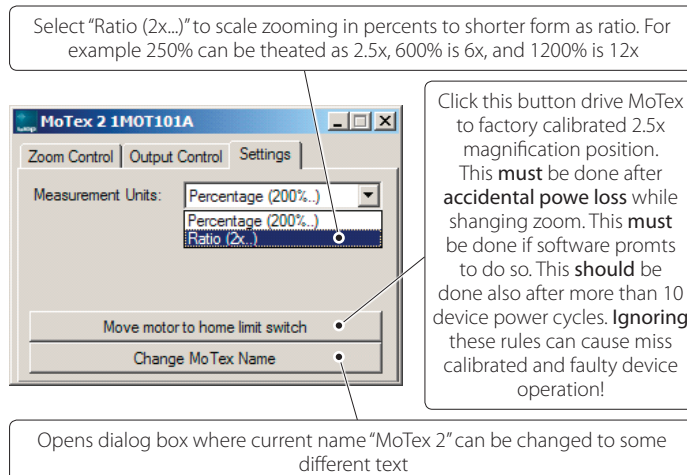


Figure 12. “Settings” tab.

Button “Move motor to home limit switch”. MoTex is driven by a stepper motor. Each zooming value corresponds to exact motor position. Hardware memorizes motor location after each zoom value change, so if there is any sort of disruption during magnification move, for instance – power supply loss, MoTex won’t save correct motor position. In such case, device will report false zoom value on next start, motor position will have an offset with actual zoom value. If user will try to set minimum or maximum magnification, motor will reach internal limit switches. Program is tracking limit switch activity and once limit switch is reached, a message box with a warning message will appear, urging to press this button:

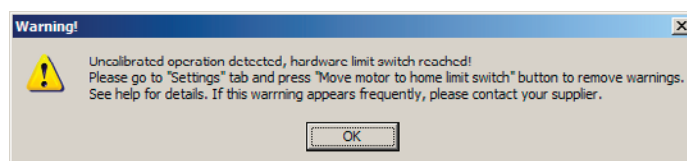
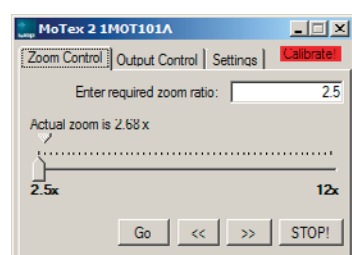


Figure 13. Message box saying that user should home MoTex.

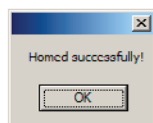
Beside this message box, user will see red-highlighted text “Calibrate!” in the upper right corner of the window in fig. 14. “Move motor to home limit switch” button must be pressed to remove this reminder. This process cannot be automated by program itself, because MoTex will change zoom value when homing and such behavior would be inappropriate to user.

This button should also be pressed if MoTex is power supply cycled more than 10 times. Almost every power cycle induces a minute stepper motor motion, because it loses its holding torque and comes to most stable position. These movements tend to occur in random directions and mostly cancel themselves, we advice to home MoTex frequently depending on individual usage. Such accidental motor movement induces 0.1% in zooming error, 10 such errors could lead to 1% of zoom accuracy in worst case scenario.

Button “Change MoTex Name” will open window where user can rename MoTex device (). Name will be updated and visible in “Control” window title bar and in “MoTex” selector list. Name must be up to 20 characters in length.

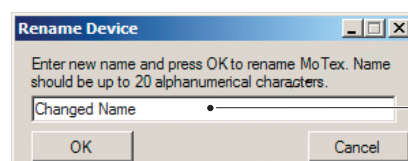


(a)



(b) First sub-figure

Figure 14. Red warning reminding that user should home MoTex (left). This message will appear after successful MoTex home operation (right).



Enter new MoTex name here.
Click OK to apply

Figure 15. MoTex rename window.

6. MOTEX USAGE WITH PC - ADVANCED USERS

6.1. VIRTUAL SERIAL PORT

When MoTex is attached to the computer, it appears as "Virtual serial port" or "COM port" under computer devices list. Such ports are used to send and receive alphanumerical or binary data to variety of devices; traditionally it is used to control GSM modems and mobile phones. MoTex receives commands that are sent to that port and changes zoom level accordingly. MoTex can be controlled by opening this port with any kind of terminal software (for example "Hyper terminal", which is preinstalled in Windows XP), and manually entering dedicated commands (see "MoTex serial command summary" on page 8). Another option to use MoTex is to write scripts or software that automates command management. This possibility should be interesting to laboratory users, working with telemetry or scientific software packages, for example National Instruments "LabView", which has support for serial port communication. "Altechna R&D" supplies fully functional MoTex control software for users running most of Windows Operating system versions.

USB drivers and/or "MoTex" software should be installed before connecting MoTex to computer. Follow section "Software installation" on page 4 to install it. MoTex virtual serial port driver and "MoTex" software compatibility with Microsoft operating systems is described in the table 1 below. Note that serial port driver is available for more systems than "MoTex" software. For example, you can send MoTex commands via serial port from Windows XP Service Pack 1, because driver is available, but "MoTex" software will not run unless Service Pack 3 is installed.

Table 1. MoTex supported Microsoft operating systems.

Operating system	Has "serial port" driver support?	Has "Motex" software support
Prior to Windows 2000	No	No
Windows 2000 (32-bit)	Yes	No
Windows XP (32-bit) Yes	Yes, with Service pack 3 installed	
Windows Server 2003 (32-bit)	Yes	Yes, with Service pack 2 installed
Windows Vista (32/64-bit)	Yes	Yes, with Service pack 1 installed
Windows Server 2008 (32/64-bit)	Yes	Yes
Windows 7 (32/64-bit)	Yes	Yes
Windows 8 (32/64-bit)	Yes	Yes

6.2. UNIX-LIKE OPERATING SYSTEM

There is no need to install any drivers on modern Unix-like (Linux "Ubuntu", "Slackware", MAC OSX) operating systems. MoTex is automatically recognized and installed as "ttyUSB" device after connecting it to computer. Serial port called "ttyUSB0" is assigned to MoTex controller automatically by OS. You can check which serial port is assigned in Your computer with „sudo |dmesg | grep cp210x“ command. We communicated with controller by using „CuteCom“ program. Currently we do not have prepared software libraries for MoTex yet, but user will find all essential functions written in C# (Visual studio 2010) in „WattPilotProgrammingExample.7z“. This archive contains source project. "Compiled EXE.7zip" contains compiled output from mentioned sources, and „Software example. pdf" contains all controller command summary, but it can also be found in Watt Pilot user manual. This software example calculates and moves beam expander to desired zoom levels it also supports homing and motor position monitoring. You can port these essential functions from C# to any programming language You need.

6.3. MOTEX SERIAL COMMAND SUMMARY

6.3.1. IDENTIFYING SERIAL PORT NAME

First step to control MoTex using serial port and commands would be to find which serial

port is assigned for device. This can be seen in "MoTex Selector" list – see section "MoTex Selector" window overview on page 6.

In case if only drivers were installed (no "MoTex" software itself – see Table 1 on page 8) serial port name could be checked in Windows "Computer manager". Right click on "My Computer" (1), select "Manage" (2). "Computer manager" window will appear. Click on "Device Manager" under "Computer Management" tree (3) and look for "Ports (COM and LPT)" (4). Each connected and powered on MoTex appears as "Silicon Labs CP210x USB to UART Bridge (Serial port name)". Serial port name is shown in parentheses fig. 16.

Third way to identify MoTex is to open each serial port and send "Get-SerialNumber" command. If MoTex is present on that port, it will send back string starting with "1MOT" which is a part of serial number and is constant for all MoTex devices. If MoTex is not present, no bytes will be received or received string will not begin with "1MOT". Serial port read timeout can be set to 50 ms to speed up scanning process. This method is universal and can be used with any operating system. Read next chapters about serial port parameters and command list.

Linux users can find MoTeX port by executing command “root |dmesg | grep cp210x”:

In the picture above we can see that one MoTeX (cp210x) device is assigned to “ttyUSB0” port. There is also shown installation command for “CuteCom” package, which is easy to use terminal application with GUI.

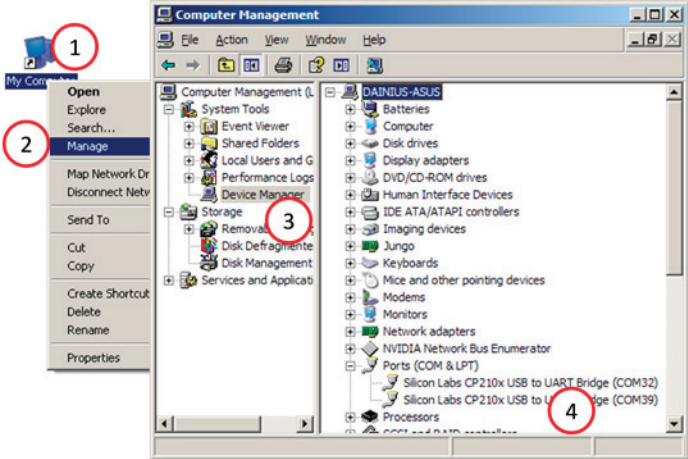


Figure 16. Finding MoTeX serial port name using Windows “Computer Manager”.

6.3.2. SERIAL PORT PARAMETERS

Serial port parameters to be used are shown in a table below.

Table 2. Serial port parameters.

Baud rate	38400
Parity	None
Handshaking	No
Stop bits	1

6.3.3. SERIAL COMMANDS AND PROTOCOL

MoTeX is a slave device according to computer and computer is a master device. That means that PC sends data requests to MoTeX, and MoTeX must respond. MoTeX itself will never send data to computer without request.

MoTeX writes all received bytes to internal buffer. If it receives “carriage return” symbol (or ‘nr’ in C++ denotation, 13’t h symbol in ASCII table, or 0x0D in hex), device will try to parse received bytes as a command string and will execute it if no errors was found. MoTeX echoes back every byte it receives back to computer except for ‘nr’. Symbol echoing is essential for users who literally type commands in terminal window. This enables user to see what data is sent to device, because not all terminal programs has a text field where sent symbols are shown.

MoTeX will respond to byte nr’ by sending additional data (if command requires it) and acknowledge (ACK) or not acknowledge (NACK) string. ACK string (4 bytes) is “>nrnn” (or 0x20, 0x3E, 0x0D, 0x0A in hex); NACK string is “?nrnn” (or 0x20, 0x3F, 0x0D, 0x0A in hex), first symbol is “space”. If MoTeX response ends with ACK string, it means that received bytes were parsed successfully and device is ready to receive next command. If response ends with NACK, it means that receive buffer had no valid command, command was ignored and device is ready to receive next command. Termination symbols “nrnn” are essential for users who literally type commands in terminal window. These symbols are not visible, but they format “received data” window text so it looks organized.

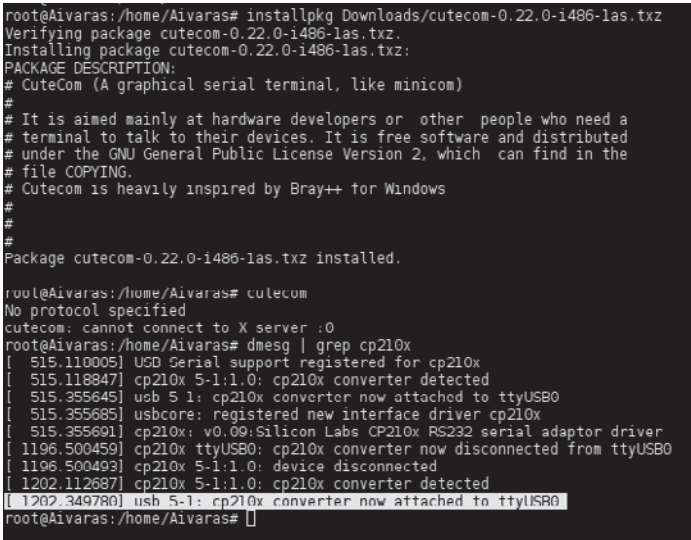


Figure 17. Finding MoTeX serial port under Linux. Screenshot is taken on Slackware Linux 13.37 32 bit OS.

From computers perspective each command is ended by byte ‘nr’. “Enter” key press usually sends this symbol in most of terminal programs. Command and command parameter is separated by space symbol (0x20). For example, typing such string “zs 3000” in terminal application and pressing enter key on the keyboard will set MoTeX zoom to 300.0%. Here “zs” (0x7A, 0x73) is a command, space (0x20) is a separator, and “3000” (0x33, 0x30, 0x30, 0x30) is a command parameter that corresponds to 300.0%. All sent bytes in hexadecimal will be (0x7A, 0x73, 0x20, 0x33, 0x30, 0x30, 0x30, 0x0D), including command end symbol ‘nr’, or “Enter” key press. New command can be sent only after ACK or NACK received, otherwise command misinterpretation can occur. See table below for more commands.

Table 3. Serial commands description.

Command name:
Zoom set
ZS X
Description:
Sets zoom value in range of 250.0% .. 1200.0%, in 0.1% steps.
Parameter x:
Integer number in range 2500 .. 12000. Last digit equals to 0.1%. This command can be used in polling mode. Polling interval can be 30 ms or more.
Return string:
;[1];[2];ACK
[1] – integer. MoTeX internal command parser output for parameter x. This value is a copy of parameter x, as MoTeX understood it. For instance, user can send erroneous command “zs nr”, that has no parameter at all, only space. MoTeX will parse such string as it was “zs 0nr”, in other words no digit means “zero” to MoTeX command parser. This return value must always be the same as x parameter for correct operation.
[2] – integer. Error status. Error status value meaning:
0 – OK, no error. Zooming value will be set to value returned as [1];
1/2/3 – Integer. Hard stop error. This means that one of hardware limit switch was activated. User must execute “Go Home” command (see section “setings TAB”). Zooming value will be set to value returned as [1];
4 – Already moving error. Previous “Zoom Set” or “Go Home” command is not completed yet. Wait for it to complete (use “Zoom Get” command to check device status). This command is ignored, MoTeX continues movement;
5 – Out of range error. Value [1] is not in the range 2500..12000. This command is ignored, MoTeX state did not changed; Usage example: send

command "zs 6005nr" [0x7A, 0x73, 0x20, 0x36, 0x30, 0x30, 0x35, 0x0D] to set zoom value to 600.5%. Terminal will receive string: "zs 6005;6005;0; >nrnn" [0x7A, 0x73, 0x20, 0x36, 0x30, 0x30, 0x35, 0x3B, 0x36, 0x30, 0x30, 0x35, 0x3B, 0x30, 0x3B, 0x20, 0x3E, 0x0D, 0x0A].

Echoed back bytes are "zs 6005". Response is ";6005;0;". "6005" means that zoom will be set to 600.5%, "0" means zoom changing has begun. If "4" will appear instead of "0", one must wait till previous operation completes. "2" means that "Go Home" command must be sent for proper operation.

Command name:

Zoom get

zg

Description:

Get current zoom value. Can be used to update graphical user interface (GUI) with zoom status at real time. Can also be used to check if previous zooming operation has completed. This command can be used in polling mode. Polling interval can be 30 ms or more.

Return string:

[1];[2];[3];ACK

[1] – Integer. Possible values are "0" and "1". "1" means that currently MoTex is changing zoom value or homing and cannot accept "Zoom Set" command. Monitor this value in order to check if device is ready to execute "Zoom set" command. "0" means that device is stopped and can execute "Go home" or "Zoom Set" commands.

[2] – Integer in range of 2500 .. 12000. Current zoom value. 2500 represents 250%, 12000 equals to 1200%. Monitor this value if application requires refresh MoTex status.

[3] – Integer. Hard stop error status. One of hardware limit switch was activated if this value is not equal to "0". User must execute "Go Home" command for proper future operation (see section "setings TAB") [3] – Integer. Hard stop error status. One of hardware limit switch was activated if this value is not equal to "0". User must execute "Go Home" command for proper future operation (see section "setings TAB").

Usage example: send command "zg" [0x7A, 0x67, 0x0D]. Terminal will receive string: "zg0;2500;0; > nr nn" [0x7A, 0x67, 0x30, 0x3B, 0x32, 0x35, 0x30, 0x30, 0x3B, 0x30, 0x3B, 0x20, 0x3E, 0x0D, 0x0A]. Echoed back bytes are "zg", response is "0;2500;0;". First "0" means that MoTex motor is stopped, "2500" represents current zoom (250.0%). Second "0" means that no hardware errors occurred. If this value becomes "1", "2" or "3" "Go Home" command must be executed for normal operation.

Command name:

Stop

st

Description:

Stop MoTex motion. This command will cancel current zooming operation, use "Zoom Get" command to check and wait for MoTex to stop.

Return string:

ACK

Usage example: send command "stnr" [0x73, 0x74, 0x0D]. Terminal will receive string "st >nrnn" [0x73, 0x74, 0x20, 0x3E, 0x0D, 0x0A]. Now keep sending string "zg", and wait until response to this command will become "0;x;x;", which means motor is stopped.

Command name:

Go home

zp

Description:

This command drives MoTex to factory calibrated 2.5x magnification position. This command must be sent if "Zoom Set" command returns error code "1", "2" or "3", or if "Zoom Get" commands return value [3] is not equal

to "0". These error flags are reset to "0" after issuing this command. Use "Zoom Get" command to check if motion has finished.

Return string:

ACK

Usage example: send command "zpnr" [0x7A, 0x70, 0x0D]. Terminal will receive string "zp > nrnn" [0x7A, 0x70, 0x 20, 0x3E, 0x0D, 0x0A]. Now keep sending string "zg", and wait until response to this command will become "0;x;x;", which means motor is stopped.

Command name:

Show Name

pn

Description:

Return MoTex name. Name can be up to 20 characters in length.

Return string:

[char array]ACK

[char array] – up to 20 bytes.

Usage example: send string "pn nr" [0x70, 0x6E, 0x0D]. Device will send back string "pnMoTex > nrnn" [0x70, 0x6E, 0x4D, 0x6F, 0x54, 0x65, 0x78, 0x20, 0x3E, 0x0D, 0x0A]. In this case, beam expander name is "MoTex". Use "Save Name" command to rename the device.

Command name:

Save Name

sn x

Description:

Set new name for MoTex. Name can be up to 20 characters in length. Parameter x: char array, up to 20 characters.

Return string:

ACK

Usage example: send string "sn New Name nr" [0x73, 0x6E, 0x20, 0x4E, 0x65, 0x77, 0x20, 0x4E, 0x61, 0x6D, 0x65, 0x0D] to set MoTex name to "New Name". Device will send back string "sn New Name > nr nn" [0x73, 0x6E, 0x20, 0x4E, 0x65, 0x77, 0x20, 0x4E, 0x61, 0x6D, 0x65, 0x20, 0x3E, 0x0D, 0x0A].

Command name:

Show serial number

pw

Description:

Show MoTex serial number. This string should be used to distinguish between several devices attached to the same computer. MoTex serial number begins with "1MOT". Rest of the symbols always differs.

Return string:

[char array]ACK

[char array] – up to 16 bytes.

Usage example: send string "pw nr" [0x70, 0x77, 0x0D]. Device will send back string "pw1MOT101A > nrnn" [0x70, 0x77, 0x31, 0x4D, 0x4F, 0x54, 0x31, 0x30, 0x31, 0x41, 0x20, 0x20, 0x20, 0x20, 0x20, 0x20, 0x20, 0x20, 0x3E, 0x0D, 0x0A]. In this case serial number is 1MOT101A.

6.3.4. SOFTWARE RECOMMENDATIONS

There are plenty of applications built for serial port communication. Windows XP (and full installations of Windows 7 or Windows 8) has native "hypertrm.exe" terminal application that can be launched by typing "hypertrm" in "Run" dialog (Winkey + R). Linux and OS X users can use free "CuteCom" (<http://cutecom.sourceforge.net>) utility, see Figure 10 on page 6. For Windows OS it is recommended to use free tool "terminal.exe" from <https://sites.google.com/site/terminalbpp>.

Configure "terminal.exe" as follows:

1. Select correct com port number (see Identifying serial port name on page 8);
2. Select correct serial port configuration values (see Table 2 on page 9);
3. Set "Hex" checkbox if received characters should also be shown as hexadecimal values;
4. Click "Connect" button;
5. Type in command and press "Enter" key on keyboard. Command string "pnr" is sent to device as shown in example picture. Look at the Table 3 on page 9 for available commands;
6. MoTex response is shown in middle pane. Hex representation of all received bytes are shown on the right. MoTex name is set to "New Name", as shown in fig. 18.

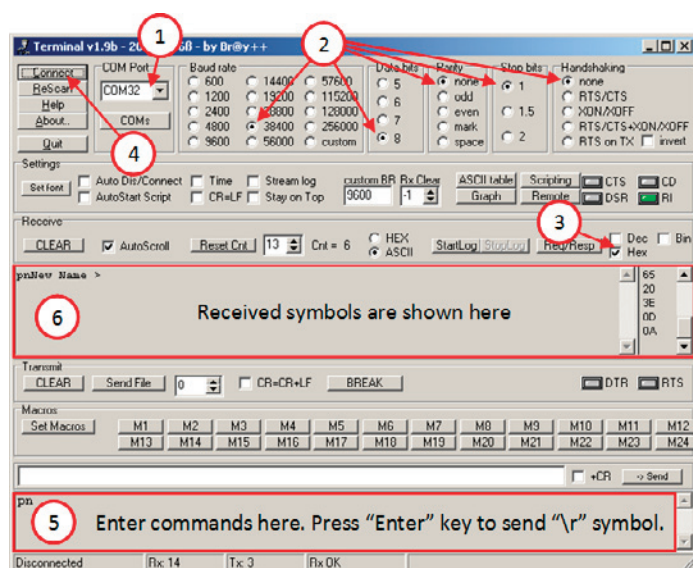


Figure 18. "terminal.exe" window with "Show Name" command sent.

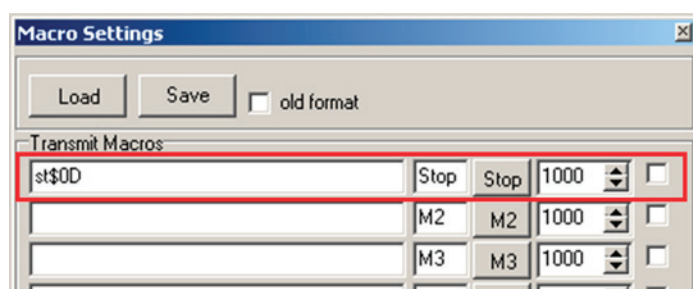


Figure 19. Command string presets can be configured by clicking "Set Macros" button in main "terminal.exe" window.

Presets can be configured for frequently used commands. Click "Set Macros" button, "Macro Settings" window will appear.

Type in string which should be sent, and name of this preset. Hexadecimal values can be entered with "\$" prefix. For example command end symbol "nr" [0x0D] should be entered as "\$0D". "Stop" command definition is shown in example. Click "Save" button to save your presets. "Stop" button will appear in "Macros pane" of main window. Press it to stop MoTex motion.

7. FREQUENTLY ASKED QUESTIONS

1. Q: Actual zoom level is not what I have set using terminal or "MoTex" software. What should I do?

A: "Go Home" command should be sent MoTex either by issuing "zpnr" command – see Table 3 on page 9, or by pressing "Move motor to home limit switch" button in "MoTex" software "Settings" tab (see page 7).

2. Q: I see "Firmware upgrade" window. What should I do?

A: "MoTex" software always checks firmware version on device, and updates it if needed. This process will take up to one minute and requires that user do not disturb update process. This process is not cancellable. Do not disconnect USB and power supply cables, do not shutdown computer. This window can appear after "MoTex" software is updated, because latest firmware comes with latest MoTex installer file. Upgrading process is indicated by "Firmware Upgrade" window. Confirmation message will appear after process is completed and program will continue as usual.



8. TROUBLESHOOTING

Firmware upgrade process was interrupted. I cannot communicate with device anymore.

1. Close "MoTex" software window;
2. Disconnect power supply from MoTex by unplugging power supply plug;
3. There is a 1 mm hole in the left of status LED. Firmware recovery button is located under it. Use not metallic stick and press that button. Keep it pressed and connect power supply;
4. Release this button after plugged in power supply plug;
5. Start "MoTex" software, select device from the list and click "Connect" button. Firmware upgrading process will popup, wait for it to finish. Program will continue as usual.

9. CUSTOMER SUPPORT AND WARRANTY

All technical issues during the warranty period, arising from proper use of the system should be solved by Altechna R&D. Any technical issue should be discussed through Skype, phone or email and effort should be made from both sides to solve the problem in a distance through consultations. If remote solving of the problem fails, the nonworking device should be sent back to Altechna R&D through its delivery account. If the device cannot be repaired a new working device will be sent to the client as a replacement. After the warranty period expires, Altechna R&D ensures fee based maintenance. The key components of the device bear one year of warranty as a default. Extension of warranty is possible and can be quoted on request. Optics shall be treated as consumables, therefore only warranty is valid for a period of one month after the installation. If the any components are damaged by the user's fault - warranty will be invalidated and repair cost will be paid by the client.